# EXHIBIT 8
# Part 1

CRANE ENGINEERING

# Supplemental Report on Failure of New River MCAS FRP Pipe

**February 6, 2013**

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| Your Client: | Talon Industries, Inc. |
| Date of Loss: | August 9, 2011 |
| Crane File No.: | Z7561 |
| Crane Descriptor: | MAT/TALON INDUSTRIES/MCAS JACKSONVILLE |

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## *SUMMARY AND BACKGROUND*

This supplemental report follows a previous Crane Engineering report dated December 29, 2011, on the matter concerning a jet fuel leak that originated from a damaged portion of an underground FRP pipe on the grounds of the New River Marine Corp Air Station (MCAS) in Jacksonville, North Carolina on or about August 9, 2011.

The primary purpose of this supplemental report is to:

1. Present the results of simulative testing performed on an exemplar section of six-inch Ameron Bondstrand 2000 FRP pipe that utilized an excavator to induce damage to the pipe.
2. Offer rebuttal to the September 19, 2012 report titled "MCAS New River FRP Pipe Failure Investigation" prepared by Mssrs. Charles R. Manning and Thomas C. Wenzel of Accident Reconstruction Analysis, Inc. (hereafter ARAI).

The preparation of this report was requested by Mr. Cal Adams on December 18, 2012.

## *INSPECTION AND TESTING*

Testing was conducted on December 3, 2012 utilizing a 20 foot section of exemplar six-inch Ameron Bondstrand 2000 FRP pipe provided by Talon Industries, Inc. This testing took place at Quiring Trucking, LLC located at 1415 Maras Street in Shakopee, Minnesota, utilizing a Quiring excavator and experienced Quiring operator.

A flange was applied to both ends of the pipe for added stiffness and placed in trench as shown in Figure 1, such that the top of the pipe was approximately 10 inches below grade. Stakes were placed at each end of the pipe to mark its location. Soil was slowly added around the pipe and tamped as shown in Figure 2. Soil was again added to the top of the trench and tamped.

The excavator used for this testing (Figure 3) had a modified bucket (Figure 4) containing a finishing edge spanning approximately 3/5 of the bucket width and two identical teeth, each with a tip approximately 3.2 inches wide.

Four individual tests were conducted in which the bucket was lowered over the pipe in a position and motion intended to simulate digging (Figure 3, bottom photograph). The bucket was allowed to contact, scrape and induce damage to the top of the pipe (in an axial manner). Two tests were conducted in which the finishing edge of the bucket was allowed to contact the pipe (Tests #1 and 4), and two tests in which the inner tooth was allowed to do the same (Tests #2 and 3). All four tests were conducted in a nominally similar manner and procedure by the operator of the excavator. All tests were documented with digital photographs and a digital video recording.

Each test is photographically depicted in Figures 5a and 5b (finishing edge) and Figures 5c and 5d (tooth). In each figure, the top photo shows the test in progress, and the bottom photo shows the resultant damage to the pipe. For each test type (finishing edge vs. tooth), the resultant damage was similar. Figures 6, 7 and 8 show the damage induced by the finishing edge at

various levels of magnification (using digital photography). Figures 9, 10 and 11 show the same for damage induced by the bucket tooth.

The damage to the pipe inflicted by the finishing edge can be characterized as damage induced due to the inward deflection of the pipe under the force of the bucket resulting in diffuse, but permanent crush damage to all areas underlying the finishing edge contact surface (Figures 5a, 5b, 6, 7, 8). Several broken fibers are visible along with interlayer delamination (sub-surface). However, virtually no material (glass fibers or resin) was removed in these two tests, and the original contour of the pipe was largely preserved.

The damage induced by the bucket tooth was distinctly different from that of the finishing edge. As shown in Figures 5c, 5d, 9, 10 and 11, a path of damage was induced that was largely governed by the width of the tooth tip (3.2 inches). In stark contrast to the damage induced by the finishing edge, the tooth sheared and severed the bulk of the fibers it contacted (mainly at the two corners of the tooth) with substantial material lost. As indicated by the arrows in Figures 10 and 11, the underlying layers of glass fibers were also sheared by the edges of the tooth. Unlike the crushing effect of the finishing edge, the tooth tended to scrape the pipe, causing a trough to form by removal of glass fibers and resin. The width of this trough was nominally the size of the tooth (~3.2 inches; see Figure 12). A fragment of material recovered from Test #3 (tooth testing) is shown in Figure 13. The width of this fragment was measured to correspond to the width of the tooth used.

Figure 14 exhibits a photograph of the subject damaged FRP pipe in comparison with representative photographs of the exemplar damaged pipes (finishing edge and tooth). The generic features of the damage exhibited by the subject pipe bears strong resemblance to that of the exemplar damage induced by the tooth.

## *ANALYSIS*

### *Testing of Exemplar FRP Pipe*

The physical testing described above provides definitive evidence that the subject FRP pipe was in fact damaged by a "well-defined" shape, such as a bucket tooth, as described in the Crane Engineering report dated December 29, 2011. This physical testing is also demonstrative evidence that the Talon excavator (utilizing a straight ~24 inch finishing edge) could not have caused the damage to the subject FRP pipe. That is, the straight finishing edge of the Talon bucket could not have formed the well-defined, deep, trough-like scrape that was observed on the subject pipe.

### *ARAI Report dated September 19, 2012*

In the ARAI report, Mssrs. Manning and Wenzel arrive at 14 conclusions. Crane Engineering agrees with the following conclusions: 1 – 4, 7 – 10. Following are rebuttal responses to their conclusions: 5, 6, 12 – 14.

- Conclusions 5 and 6

  These two conclusions are similar in that they claim the damage to the subject pipe to have been caused by "straight edge" and that the Talon bucket was, therefore, capable of

producing the damage. These conclusions, linking Talon to the subject damage, appear to be based entirely on their conceptual schematic drawing they provide as Figure 9 in their report. This drawing appears to have been created as a mental exercise and not the result of any experiment or calculation. However, Figure 9 provides a reasonably good depiction of pipe deformation under influence of a straight edge. That is, it is a reasonable representation of the "finishing edge" testing described above and the damage (a diffuse crush of the pipe) that resulted from this testing. In no way does Figure 9 illustrate or provide any information that explains the formation of the observed "trough" damage exhibited by the subject FRP pipe. This damage, characterized by well-defined shearing of the glass fibers on the subject pipe can only be explained by the presence of teeth on an excavator bucket, something the Talon excavator did not possess.

- Conclusion 12

  The Manning/Wenzel report states: "There was no evidence produced to suggest that any excavation work had been performed in the area of the damaged pipe since original installation 27 years prior to the subject leak". This statement is not informative, as it can be countered with an equally true statement such as: "There was no evidence produced that excavation work was not performed". The only definitive evidence of whether or not work had been performed since the pipe's original installation lies with the clay backfill that was found at the location of the damage and the condition of the marker tape. The clay surrounding the subject pipe at that specific location was unique. In contrast, all other XX potholes that were dug to locate the FRP pipe found sand as the embedment material surrounding the pipe. In fact, sand is a typical material for such an installation, while clay is not. The Ameron Bondstrand Installation literature requires the FRP pipe to be laid on a bed of sand with the pipe zone backfilled with "granular materials" such as sand, gravel or crushed rock. Clay is most definitely not a granular material. The only conclusion that can be drawn is that work had indeed been performed at this location since the pipe's original installation, but before the work for which Talon was contracted. Comment on marker tape.

- Conclusions 13 and 14

  These conclusions implicate Talon Industries mainly on the basis of Conclusions 5, 6 and 12 discussed above. Given that Conclusions 5, 6 and 12 are demonstrably false, it follows that Conclusions 13 and 14 are also false, and that Talon was not responsible for the subject damage.

The bulk of the other "evidence" provided by plaintiffs is subjective, speculative and unsubstantiated, and sometimes in contradiction. Their conclusions are drawn from various notions such as:

1. The exact location of the pot hole relative to the damaged portion of the pipe (as determined by photographs of unknown origin and position).
2. Arguments over how "compact" the soil was as Talon workers were digging outward from their pot hole to find the location of the leak.

3. Unsubstantiated statements about the damage being recent (Applied Plastics Services, Inc. and AMEC. No supporting evidence, observations, measurements or experiments are provided as to how the age of damage was determined.
4. The condition of the marker tape. Contradictory statements have been made as to whether or not the tape was intact.

In summary, Crane Engineering reaffirms the conclusions (and substantiating evidence provided) of its original report dated December 29, 2011 that Talon Industries was not responsible for the subject damage to the FRP pipe. The tests on the exemplar FRP pipe offer definitive, factual and indisputable evidence that the finishing edge used by Talon's excavator was completely incapable of causing the type of damage that was observed on the pipe.

## *CONCLUSION*

The opinions and conclusions expressed below are based on information to date, my inspection of the subject FRP pipe, my testing of an exemplar pipe, as well as my training, education and experience. These opinions and conclusions are held to a reasonable degree of engineering certainty. As additional information becomes available, I reserve the right to supplement or otherwise amend my opinions if warranted by future discovery.

- Testing on an exemplar FRP pipe provides conclusive evidence that the Talon equipment used in digging the subject pot hole was incapable of inducing the observed damage to the subject FRP pipe. Such damage could only have been caused by an object such as an excavator with teeth on its bucket. Talon's excavator had a finishing edge.
- The conclusions of the previous Crane Engineering report dated December 29, 2011 are still valid.
- Talon Industries bears no causal responsibility for the damage to the subject FRP pipe.

Respectfully submitted,

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

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Figure 1. Exemplar Ameron Bondstrand 2000 pipe (with flanges) used for testing.

Figure 2. Soil was tamped around exemplar pipe.